Experience on Mass Hormonal Oestrus Synchronization and Insemination of Cattle to Improve Supply of Dairy Genetics under Smallholder Conditions in Ethiopia

Azage Tegegne, Dirk Hoekstra, Berhanu Gebremedhin, Solomon Gizaw

Livestock and Irrigation Value Chains for Ethiopian Smallholders (LIVES) Project, International Livestock Research Institute (ILRI), P.O. Box 5689, Addis Ababa, Ethiopia

Email: a.tegegne@cgiar.org

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Introduction

- Ethiopia has about 90 million people and 54 million cattle (CSA, 2012/13) with about 11.2 million breeder cows.
- Calving rate is about 45%; average milk production is 1.32 litres/cow/day with total annual milk production of 3.81 billion litres; and 82% is consumed or processed into butter at farm level
- According to CSA (2012/13), per capita milk consumption is about 19 kg/year, lower than averages for sub-Saharan Africa (40 kg/year)
- Annually Imports USD 12 million worth of milk and milk products to fill the demand-supply variance.
- However, there is huge potential for dairy development due to large human and livestock population, suitable agro-ecologies, culture of milk consumption, etc.
- Smallholders are limited by a number of factors from participating in milk production and marketing. One of the major problems is lack of access to and high price of improved dairy animals.

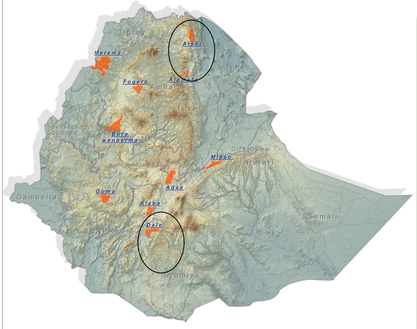
Objectives

- to test simple hormonal synchronization regime under smallholder farm conditions,
- to improve access to improved dairy genetics by smallholder farmers , and
- to kick-start the development of market-oriented smallholder dairy production system in selected sites.

Why synchronize in the Ethiopian smallholder context?

- To produce large number & uniform animals of desired germplasm (kick start)
- To match calving with feed availability and market demand for milk and milk products
- To control oestrus period and improve the effectiveness and efficiency of AI service
- To increase the number of marginalized/endangered breeds (eg. Fogera cattle)
- To quickly multiply breeds with specific genetic merit (eg. Sheko) and to contribute to resilience of pastoral live-stock systems – re-stocking
- To mitigate environmental impact of livestock through more from less

Materials and Methods



Location, sampling procedure, treatment and data analysis

The first phase of this study was conducted in Tigray and Southern Nations, Nationalities and Peoples Regional States in Ethiopia. Two milkshed were selected:

- In Tigray—Adigrat-Mekelle milk shed in Tigray and Awassa-Dilla milk shed in SNNPR were selected.
- Market opportunities—Awassa and Mekelle Regional Capitals
- Experience with dairy production and milk marketing
- Households with at least two cows and adequate feed resources
- Cows with CL were given single injection of PGF2α and insemi-nated upon observed estrus. Pregnancy was determined per recturm after 3 months.
- Statistical analysis were performed using SPSS version 12 Soft-ware package.

Processes and Results

Existing AI system

- Mobile, stationary, on-call basis (urban areas)
- One Technician expected to do about 300 AI per year—ranges from 50 to 1000
- Pregnancy rate of existing AI system after 1st insemination is about 27%.
- Considering that only half of the pregnant cows will deliver female calves, the annual output of an AI technician is estimated at about 41 female calves
- Weak performance of the system has led to the country having only 350,000 improved dairy animals
- Problems include technical, transport, quality of semen, poor heat detection, lack of incentive, una-vailability of service off-working hours (weekends, holidays, etc.)

Organizational and institutional arrangements

Community mobilization, construction of animal handling facility and selection of healthy animals with good BCS and functional corpora lutea

On-farm oestrus synchronization in action

Table 1. Performance of oestrus synchronized cows in two Regional States, Ethiopia

Variables	Awasaa-Dale Milk-shed		Adigrat-Mekelle Milkshed	
	No.	%	No.	%
Total animals presented for synchronization	210	-	212	-
No. animals treated with $PGF_{2\alpha}$	175	83.3	199	93.9
No. of cows that aborted	-	-	6	3.0
Final No. cows synchronized	175	100	193	97.0
No. of animals that responded to $PGF_{2\alpha}$ treatment	171	97.7	193	100.0
Animals that died (after insemination) Animas that did show up for pregnancy diagnosis	3 5	1.8 2.9	- -	- -
Interval to oestrus, hours	NA	-	45.13	-
Pregnant animals	94	57.7	119	61.7

- Six cows aborted after treatment due to early pregnancy and owners had no idea when they were bred.
- Good estrus response due to selection of cows with good body condition and functional corpora lutea
- Some farmers were reluctant to bring their cows for pregnancy diagnosis per rectal palpation as they con-sidered this intrusive and may damage the early fetus.
- Improved effectiveness efficiency of the AI service delivery (more inseminations/AI technician).
- Pregnancy rate was about 60 %, due to proper timing of AI.
- Complements government plan on climate change and green economy (more from less) and milk shed de-velopment through smallholder farmers market-oriented dairy development
- Could be applied for genetic improvement of selected local beef cattle breeds and rehabilitation of endan-gered breed of multiplication of breeds with special characteristics, eg. trypanotolerance

Promotion for scaling up

- Awareness creation; field visits, workshops, publications, (leaflets, articles, case reports, etc.); DVD's, TV interviews, newspapers, gender in dairy development, engaging high level decision mak-ers, technical staff, experts and farmers.
- Mobilizing resources, demarcation of other potential milkshed, capacity building, and technical backstopping.

Conclusions and Recommendations

- Oestrus synchronization could be implemented under smallholder farmers conditions
- Requires a well planned & organized technological intervention with appropriate organizational and in-stitutional arrangements
- Needs a well training & organized multi-disciplinary team (livestock science, feeds and nutrition experts, veterinarians, AI technicians, etc.) and proper leadership, good planning, implementation, follow-up
- Awareness creation, proper training, selection of the right farmers and animals (good BSC, free from dis-eases and with functional ovaries)
- Community participation involving administration, office of agriculture, local leaders, lead farmers, partic-ularly women farmers
- Proper animal handling facility, adequate supply of inputs, consumables, equipment, transport, etc.
- Possible to scaling-up in areas where there is shortage of crossbred animals and potential for dairy devel-opment.

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